Mortuary Practice in the Cook Islands

by

Susan C. Antón & Rhonda L. Quinn, Rutgers University

David W. Steadman, University of Florida.

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Ann L. W. Stodder, Organizer and Chair

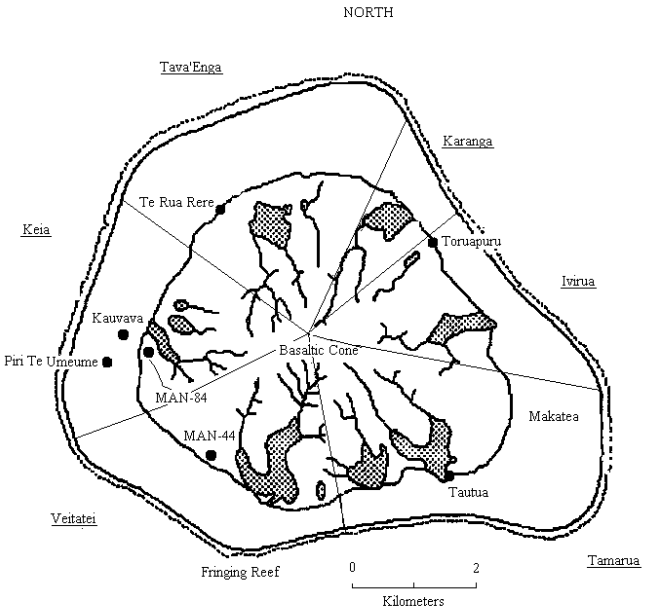
Abstract:

The behavioral, cultural, and political implications of human skeletal remains found in non-mortuary contexts requires that we understand the range of mortuary practices in a particular region. Using ethnohistoric accounts, archaeological excavation, and burial cave surveys we reconstruct the range of skeletal patterns encountered in archaeological contexts in the Cook Islands and the taphonomic factors that affect the interpretations of these patterns. Multiple mortuary practices are encountered that both confirm and expand on those documented in the ethnohistoric record. These practices differ in the archaeological signals they leave and change in their relative frequency through time.

Introduction:

Pre-European mortuary practices in the Cook Islands are diverse, possibly reflecting tribal relations, warfare, and ecosystem degradation. Burials in caves and *marae* (temples) were among the ceremonial contexts for paying tribute to the deceased within tribes; however, at least in the case of the burial caves a secondary aim may have been to hide remains from neighboring and warring tribes. Human skeletal material has also been recovered from earthen ovens in rockshelter sites, perhaps suggestive of cannibalism. The largest database of archaeological human skeletal remains is from Mangaia, Cook Islands (e.g. Steadman and Kirch, 1990; Endicott, 2000; Steadman et al., 2000; Anderson and Antón, in press; Antón and Steadman in press). Here we describe mortuary practices on Mangaia and interpret each context with reference to environmental change and societal structure.

Figure 1. Map of Mangaia, Cook Islands,
showing the six traditional districts and sites mentioned in the text.



Setting:

The Cook Islands are located in the Cook-Austral volcanic chain in the south Pacific. Mangaia (Fig. 1) is the most southerly of the Cook Islands (157.55E, 21.55S) and consists of a heavily weathered basaltic cone, reaching 168 m at its summit, surrounded by a continuous raised limestone reef, *makatea* (Fig. 2), that reaches some 70 m in height, and is thus bounded by cliffs on both the inland and seaward sides (Stoddart et al. 1985; Yonekura et al., 1988; Steadman and Kirch, 1990). The basaltic cone emerged approximately 16.6-18.9 Ma based on potassium-argon (K/Ar) dating methods, and the earliest fossil coral formed between 90-115 ka according to uranium-thorium ($^{230}Th/^{234}U$) and U-series methods (Yonekura et al., 1988). From its summit to the coast, Mangaia is divided radially by major drainage systems into six traditional districts. In each district, only a small strip of prime agricultural land exists between the volcanic slopes and limestone cliffs.

Peopling of the Cook Islands:

Initial waves of seafaring peoples from Southeast Asia landed on Remote Oceania circa 3600 years B. P., bringing crop plants, domestic animals, simple raw materials, and fire (Kirch, 1996). Earliest human habitation of Mangaia is estimated between 2500 and 1600 years B. P. based on pollen records taken from seven depositional basins; although definitive habitation sites at rockshelters date to ca. AD 1000 (Steadman and Kirch, 1990; Kirch, 1996). Charcoal and clay deposition begins at 2500 years B. P. marking the onset of erosion due, presumably, to human practices of slash-and-burn horticulture and resultant deforestation along the basaltic cone (Kirch, 1996). Early inhabitants greatly reduced Mangaian bird populations, directly and indirectly causing extinction or extirpation of indigenous species, in a pattern similar to that seen

elsewhere in the Pacific (Steadman, 1995; Steadman and Rolett, 1996). Land birds especially succumbed to human exploitation and rat infestation. European contact on Mangaia is relatively late, dating to 1823.

Ethnohistoric Mortuary Practices:

The brief ethnohistoric mention of Mangaian burial practices suggests that family members would wrap the corpse in layers of cloth and then place it in a shallow pit, occasionally within a temple (*marae*), but most often in a cave (*ana*), or in a chasm in the *makatea*, usually within a day of death (Gill, 1876:71; Hiroa, 1934:190). According to Gill (1876: 72,75) those buried in the ground were placed face down in a flexed position with limbs secured by a sennit cord and the head toward the rising sun. Stones were placed on top of these graves reportedly to keep the spirit in. Most bodies, however, were either hidden in secret caves or thrown into chasms (deep vertical crevices) to avoid interference with the body by enemies (Hiroa, 1934:191). Hiroa specifically suggested that the body of a warrior obtained by his enemies would be burned. Some secondary burial practices are described in the case of cave burials. This treatment entailed exposing the remains to the sun, rubbing them with oil, and then rewrapping them in cloth (Hiroa, 1934:191). It is not clear whether bones or desiccated corpses were treated in this way. No dismemberment, bone breaking, cleaning, or burning is reported.

Here we describe the various contexts in which human skeletal remains are found in order to confirm and augment this ethnohistoric record and to inform interpretation of rockshelter remains.

Figure 2. Limestone cliff or *makatea*.

Burial Caves:

As was the case elsewhere in the Cook Islands (Gruning, 1937) limestone caves were common burial locations well into post-European contact times. On Mangaia today, a different family controls access to each burial cave. Located within the *makatea*, cave entrances are often hidden, and as such, cave names describe the difficulty of reaching the cave or the secrecy of its location (Antón and Steadman, in press).

The caves examined are solution cavities in the *makatea* probably formed by fossil streamways (Ellison, 1994). As a result, cave floors are mostly flat or only slightly pitched. In at least parts of each cave ceilings are high enough to walk upright. Four caves described here (Tau tua, Piri Te Umeume, Te Rua Rere, and Kauvava) have at least one very large, amphitheatre-like room. All of the caves had formed by the end of the Pleistocene (Ellison, 1994), well before human colonization of Polynesia (Irwin, 1992).

None of the caves described here have been excavated. Forty above ground burials representing at least 92 individuals are found in the four caves (Table 1; Figs. 3-6). Te Rua Rere is the longest cave and the only one to contain both definitive pre- and post-contact burials. Te Rua Rere has burials throughout most of its accessible length (Fig. 5). Burials in Kauvava are concentrated near the entrance (Fig. 6). The few burials at Piri Te Umeume, a cave with two entrances, are concentrated in an alcove at the center of the cave (Fig. 3). The distribution of the caves around Mangaia indicates that using caves as burial sites was an island-wide practice during both pre- and post-contact times (Fig. 1).

Table 1. Human burial distributions (MNI and minimum number of burials) for Piri Te Umeume, Tautua, Te Rua Rere, and Kauvava burial caves.

Cave	Fig	District	Minimum Number of Burials	Minimum Number of Individuals	Time period of burials	Passage height above sea-level	Passage length[3]
Piri Te Umeume	3	Keia	3	11	Post-contact	55m	136m
Tautua	4	Tamarua	3	≥4	Pre-contact	10-20m	335m
Te Rua Rere	5	Tava'enga	~26	≥68	Pre & Post-contact	20-30m	791m
Kauvava	6	Keia	8	9	Post-contact	40m	358m
TOTAL	-	-	~40	≥92	-	-	-

Among the 40 burials, 26 were classified as pre-contact, 10 as post-contact, based on associated artifacts, and four as questionable (Table 2). At Te Rua Rere we were able to test our age designations against radiocarbon (^{14}C) dates for five burials (see below). The Kauvava burials (n = 8) appear to represent a single, brief period of post-contact use. The individuals are

interred in boxes made of milled lumber and are of similar design (including dovetailed joints) and color. Most burials contain associated colonial artifacts and all are of young children (mean age 1.8 years).

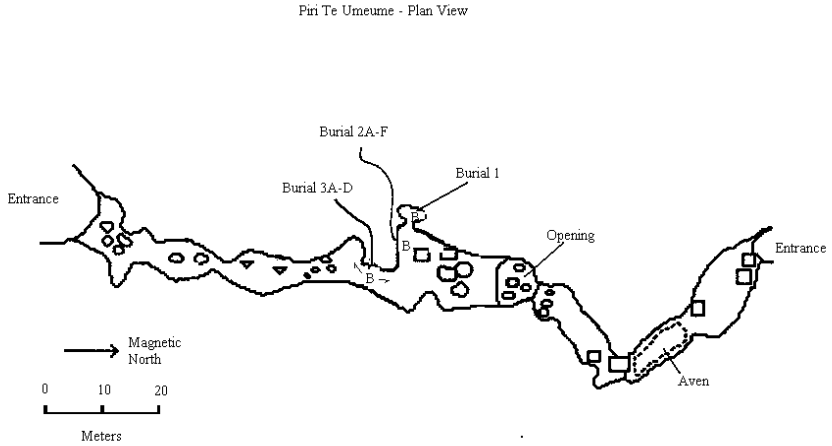
Table 2. Single and multiple interments during pre- and post-contact times for Piri Te Umeume, Tautua, Te Rua Rere and Kauvava burial caves.

	Single	Multiple	Total
PIRI TE UMEUME			
Post-contact	1	-	1
Questionable	-	2	2
All	1	2	3
TAUTUA			
Pre-contact	2	1	3
TE RUA RERE			
Pre-contact	5	18	23
Post-contact	-	1	1
Questionable	1	1	2
All	6	20	26
KAUVAVA			
Post-contact	7	1	8
ALL CAVES	16	24	40
All pre-contact	7	19	26
All post-contact	8	2	10
All questionable	1	3	4

Based on physical evidence and ^{14}C dating, Te Rua Rere appears to represent the longest period of use including both definitive pre-contact burials (R1, R8, RUPRa, based on ^{14}C dating) and early contact period burials (L11, based on European glass trade beads and supported by a ^{14}C date). Te Rua Rere lacks any evidence of milled-wood boxes or decaying boxes such as

those at Kauvava or Piri Te Umeume, however, decaying wood from what were probably dugout canoes is present in the most remote burials in the cave. Bone from one of these burials (R8b) confirms their pre-contact age and provides the oldest ^{14}C date for a burial cave (A.D. 1275-1410; Beta-114103), suggesting that use of the cave for burial purposes began at least as early as the transition period from early (before ca. A.D. 1300) to late prehistory (after A.D. 1300). European contact on Mangaia occurs in 1823. Furthermore, calcite deposition suggests relative antiquity for some of the multiple-individual burials (e.g., RUPR, L3). One of the individuals encrusted with calcite (RUPRa) yielded the second oldest ^{14}C date (A.D. 1430-1650; Beta 111944), placing this individual in the middle part of late Mangaian prehistory, well within the period of island-wide resource depletion as indicated by faunal remains at archaeological rockshelter sites such as Tangatatau (MAN-44; Steadman and Kirch, 1990; Kirch et al., 1995; Kirch, 1996).

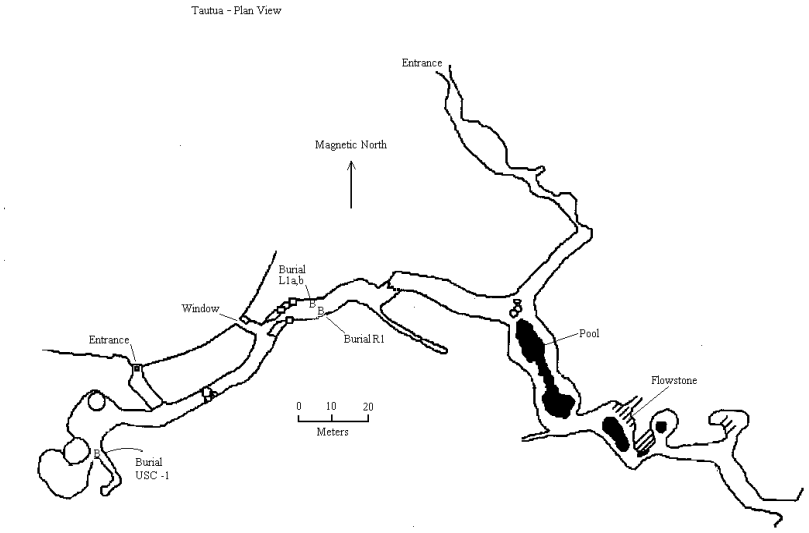
Figure 3. Plan view of Piri Te Umeume burial cave, Mangaia (taken from Antón and Steadman, in press).



Single and multiple interments are found in all caves and during both time periods, although multiple interments predominate in probable pre-contact contexts (73%, 19 of 26 burials) and single interments predominate in post-contact contexts (80%, 8 of 10 burials). Overall, multiple-interments are more numerous than single interments (24 vs 16). Pre-contact burials and bone scatters were demarcated by rocks, or placement on canoes or unmilled wood, or not demarcated at all. All post-contact burials were associated with some kind of milled-wooden box or the remains thereof.

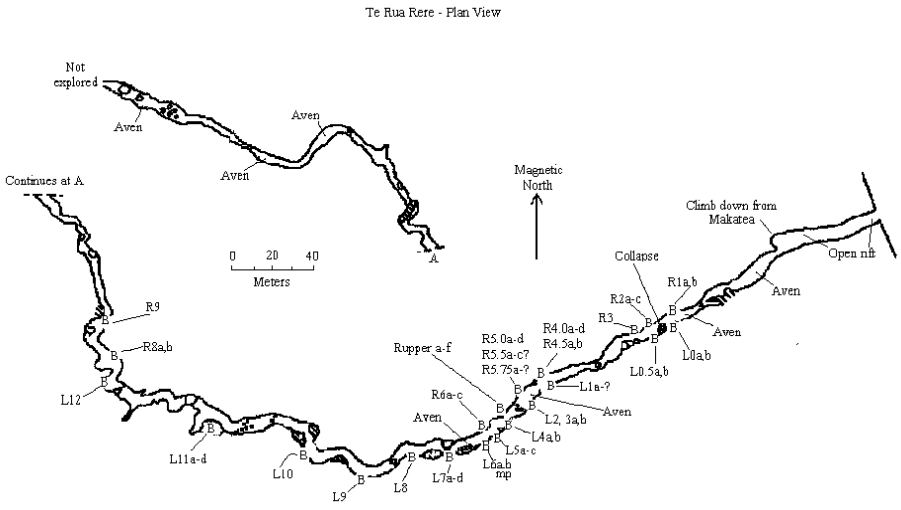
Where it was possible to discern body placement, single interments in Mangaian burial caves usually consist of an individual in extended, supine position. A few instances of single flexed burials may be present (e.g., Piri Te Umeume 1), although recent disturbance made these cases difficult to distinguish from disturbed extended burials. All post-contact single burials are of juveniles. In contrast, juveniles make up only 14.3% (1 of 7) of all probable pre-contact single burials.

Figure 4. Plan view of Tautua burial cave, Mangaia (taken from Antón and Steadman, in press).



Multiple interments are found in all caves but are rare in definitively post-contact contexts (only 2 of 21 cases). The two post-contact multiple interments are from Kauvava and Te Rua Rere, one with two and the other with four individuals. Three of the six individuals are subadults. One of the post-contact multiple interments is of two very young individuals sharing a single box (Kauvava L6a,b), whereas the other (Te Rua Rere L11a-d) contains two adult females, a young infant (circa 6 months), and a few bones of an unsexed adult. All of these burials are associated with boxes or very decayed wood; they appear to be true multiple-individual primary burials in which the bodies were placed in the cave simultaneously.

Figure 5. Plan view of Te Rua Rere burial cave, Mangaia
(taken from Antón and Steadman, in press).



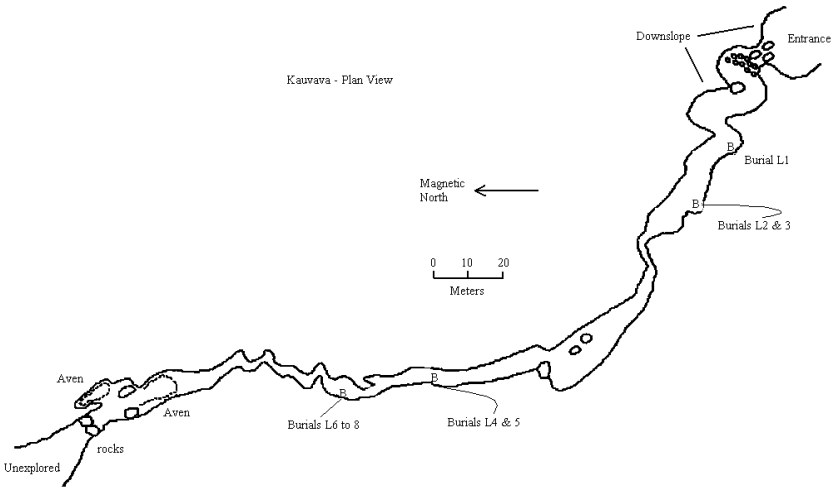
In contrast, pre-contact multiple interments, represent 90% of all multiple interments that could be assigned to time period (19 of 21 cases) and include minimally 75 individuals. These interments average 4 individuals per burial (range two to six), or one individual more than in the

two post-contact multiple interments. Equal or nearly equal numbers of subadults and adults are present in 17 of the 22 mixed-age burials. Both primary and secondary burials are present.

Nearly equal numbers of adults (n=45) and subadults (n=47) were found in the burial caves. Ages were equally represented in multiple interments, but subadults were slightly more frequent (56%) in single interments when time periods are combined.

The burial cave remains generally support and augment the brief ethnohistoric descriptions of Mangaian burial practices. As suggested by Hiroa (1934), there are both primary and secondary burials as well as circumstantial evidence of *aven* 'burial'. Furthermore, the post-contact remains are associated with cloth in which they may have been wrapped; prehistorically, such burial cloth would have been the bark cloth (*tapa*) from the paper mulberry tree, a material more unlikely to survive for centuries in the caves. Multiple interments are frequently found in pre-contact cave burials yet are not mentioned in the ethnohistoric literature. Single interments in caves are most frequently in extended rather than in the flexed position reportedly used for non-cave burials (Gill, 1876:72,75).

Figure 6. Plan view of Kauvava burial cave (taken from Antón and Steadman, in press).



Marae

Other archaeologically-derived human remains from Mangaia consist of partially articulated remains possibly in association with a *marae* (MAN-100; Endicott, 2000) (Fig. 7). Although the data concerning the human remains from this site have not been fully published, the undated bones from MAN-100 appear to represent the remnants of articulated burials. The preliminary report suggests that MAN-100 yielded far fewer (n = 4), but more complete individuals than is the case at rockshelter sites (see below). Endicott (2000) postulates that these specimens may be the remains of individuals buried in association with the *marae*, a practice recorded ethnohistorically.

Figure 7. Tukitukimata marae in Keia District, Mangaia.

Rockshelters

Archaeological traces at rockshelters suggest they were used primarily as living/habitation sites during pre-European contact times. Rockshelters occur at numerous facing-directions and levels along the *makatea*. Dimensions of living space (ground surface

under dripline) range from large, 225 m^2 at Tangatatau (MAN-44), to moderately-sized, 75 m^2 at Ana Manuku (MAN-84), to small pockets of shelter (MAN-81). Living floors record formation and use of earthen ovens, deposition of organic matter, and stone and shell artifacts. Faunal remains found associated with ovens, and therefore interpreted as human dietary sources, include shellfish, fish, dog, pig, bird, and fruitbat (Table 3). Isolated or fragmentary human bones from rockshelters and inland terraces have been periodically encountered (e.g., Endicott, 2000; Steadman et al., 2000; Anderson and Antón, in press).

TABLE 3: Faunal distribution (NISP) at habitation rockshelter sites.

Taxon	MAN-63	MAN-81	MAN-82	MAN-83	MAN-87	MAN-44	Total
Canis	-	-	-	-	-	35	36
Homo	-	-	1	2	3	18	24
Sus	-	-	1	4	4	183	192
Indet	6	3	1	4	1	247	262
Ovis	-	-	-	-	-	1	1
Felis	-	-	-	-	-	1	1
Delphinidae	-	-	-	-	-	1	1
Total	6	3	4	10	8	486	517

Living Sites

Habitation sites (Fig. 8) are interpreted as such based on the prevalence of archaeological traces indicative of daily activities, including pounders, tattoo needles, fishhooks, earth ovens and associated faunal remains. Human remains found in midden contexts at habitation sites are generally few in number (n=1-18; Table 3; Anderson and Antón, in press). In all cases, the specimens are isolated and lack evidence of articulated remains or 'burials' in the traditional sense of the word. Likewise, they are generally rare enough and exhibit enough evidence of either carnivore or pig modification that humans cannot be unequivocally assigned as their agent of introduction into the site. While Mangaia lacks indigenous predatory birds or mammals that

might accumulate bone in rockshelters (Steadman and Kirch, 1990), a scavenging dog or pig may be responsible. Despite the small number of human fragments, these tend to represent a fairly large number of individuals (Table 4).

Lack of cutmarks on human material from middens also hinders discrimination of accumulating agent (Anderson and Antón, in press). Without cutmarks, all other forms of modification, including tool production, might be classified as incidental. These modifications need not imply the *processing* of human bodies either ritualistically or for food. The scavenging activities of dogs and pigs could explain the presence of odd bits of human bone in camp and its availability for tool manufacture. Most cave burials were inaccessible to pigs and dogs, but ethnohistoric accounts suggest that soil burials were relatively shallow and could have provided a source of human remains. On the other hand, the appearance of the human bone in rockshelter sediments differs from the intentional burials seen in burial caves or *marae*.

Figure 8. Tomarumaru rockshelter.

It is possible that the human assemblages of habitation sites are the result of processing human remains either for food, as we suspect for the pig and dog, or for ritualized dismemberment. The similar patterning of human and nonhuman remains, the association with earth ovens, and the secondary production of a human bone tool at MAN-44 support this claim. Such an inference is also consistent with the ethnohistoric reports from Mangaia of cannibalism, sacrifice, and vengeful dismemberment.

However, the evidence from habitation sites is insufficient to distinguish between these two models. For example, we cannot determine whether carnivore activity preceded human modification or vice versa. The presence in the ethnohistoric record of instances of cannibalism, ritual sacrifice, and vengeful dismemberment suggests that these may account for accumulation of the assemblage.

TABLE 4: Minimum numbers of humans per site.

	Total MNI	Adult	Subadult
MAN-44	9	5	4
MAN-82	1	1	-
MAN-83	1	1	-
MAN-87	2	1	1
TOTAL	13	8	5

Special Use Sites

An exception to the scarcity of human bones in rockshelter sites is Ana Manuku (MAN-84), a rockshelter in Keia district radiocarbon dated to ca. A.D. 1400-1450 (Fig. 9). Ana Manuku yielded vastly more human bone (an NISP of 1864 human bones and a minimum of 40

individuals) than the rockshelters classified as living sites. And most of this human bone is quite fragmentary, burnt, or heated (Steadman et al., 2000).

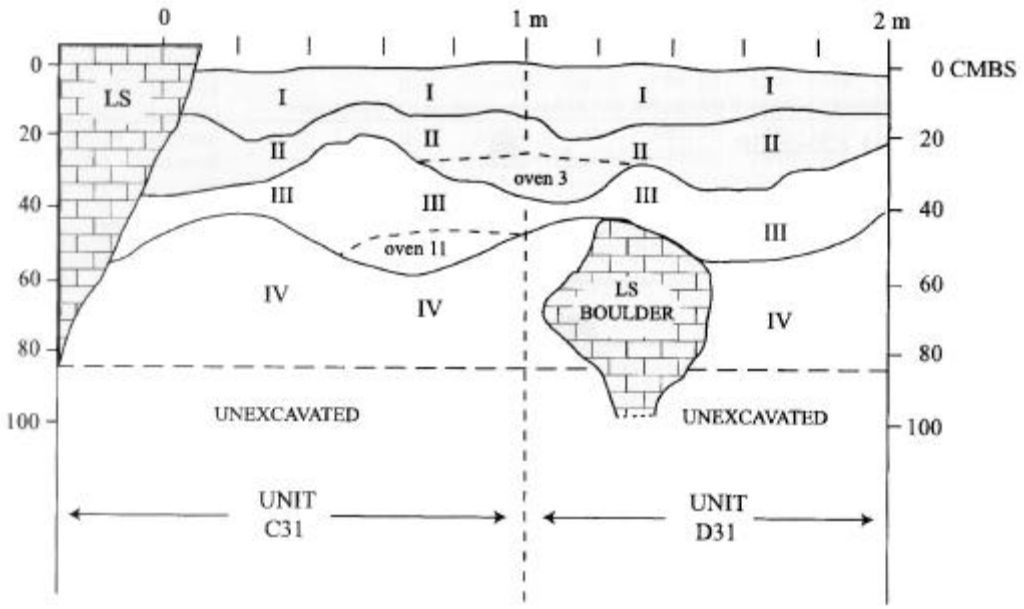
However, Ana Manuku is not representative of a typical habitation site such as MAN-44 because it lacks artifacts associated with normal daily activities (Steadman et al., 2000). In fact the entire assemblage is small and comprised largely of simple, unretouched chert flakes (52 of 63 objects). The chert is of rather low quality that originates in Mangaian limestones. The only basalt artifact was a single broken pounder. The remaining artifact assemblage consists of one, probably ornamental, pearlshell fishhook, two bone beads, a bone ball, a bifacial knife of very fine-grained limestone, and a retouched (toothed) coconut.

Figure 9. Ana Manuku rockshelter (MAN-84).

We established a chronology for MAN-84 based on accelerator-mass spectrometer (AMS) radiocarbon (^{14}C) dates on human bones representing nine different individuals, as well as conventional (beta-decay) ^{14}C dates on wood charcoal from various units (Steadman et al.,

2000). The dates provide strong evidence that deposition of human bones in Layers II and III at MAN-84 occurred primarily if not exclusively at cal AD 1400-1450, a very short interval of time (Figs. 10, 11). Because these 11 radiocarbon dates all overlap at 2σ (and most overlap at only 1σ), we must entertain even the possibility that all human bone was deposited at MAN-84 in years rather than decades. We cannot rule out that Layer II and Layer III each might represent only a single event, perhaps in successive years or even during the same year.

Figure 10. Stratigraphic section, north wall of Units C31 and D31, Ana Manuku (MAN-84), Mangaia (taken from Steadman et al., 2000).



The most commonly occurring vertebrate at MAN-84 is human, even exceeding fish and rat bones in overall NISP in the *in situ*/dry-screened fraction (Table 5). The abundant human bones from MAN-84 consist of burned, fragmentary, and isolated elements representing multiple individuals per layer per unit. These remains range in age from fetal/newborn to adults probably of both sexes, with a predilection for subadults. Minimum numbers of individuals are four adults

and seven subadults from Layer II and 10 adults and 20 subadults from Layer III. All of the human bones are clearly in a midden rather than burial context.

Figure 11. North wall of Unit C31, Ana Manuku (MAN-84), Mangaia.

Table 5. Major categories of vertebrates, Ana Manuku (MAN-84), Mangaia, by stratigraphic Layer (II & III are cultural; IV is pre-cultural). Based on recovery in situ, dry-screening through 3.3 mm mesh, and wet-screening through 2.0 mm mesh. Numbers are NISP (number of identified specimens).

Taxon	**II**	**III**	**IV**	***Total***
human	341	1515	8	*1864*
Fish	1134	716	45	*1945*
Rat	565	1030	27	*1622*
Bird	48	287	1310	*1635*
Lizard	2	13	0	*15*
Fruit bat	1	1	0	*2*
Dog	1	0	0	*1*
Total	*2092*	*3602*	*1390*	*7084*

The human bone assemblage exhibits considerable taphonomic modification, much or all of which is human induced. Although some pieces are unheated (Munsell 10YR 8/3 – 7/3), more than 84% are at least lightly browned (Munsell 7.5YR 7/4 or darker), consistent with heating at

low temperatures (Fig. 12). Some of these (20% of total) are heavily heated or burnt (Munsell 7.5YR 4/4 or darker), but only a very small portion (<1%) is calcined (e.g., Munsell chart 1 for gley 8/N). Adult and older juvenile limb bones are highly fragmented. All of these exhibit ancient fractures including, spiral and step (hinge) fractures, often accompanied by percussion pits and occasionally cut marks. Other elements, particularly ribs, exhibit "peeling" indicative of fracture when fresh (White 1992). Differential coloring patterns on either side of ancient fractures indicate that, in at least some cases, fracture preceded heating. In no case did we find definitive evidence of damage by dogs or pigs, although rodent gnawing was present.

Figure 12. Differential heating and age distribution of human skeletal material from Ana Manuku (MAN-84), Mangaia.

So while the vast quantity of human remains from Ana Manuku and the instances of human modification of these remains clearly points to humans, rather than pigs or dogs, as the agents of introduction of the remains into the site, it also removes these activities from those of normal daily life. This suggests a special-use for the site and raises the possibility of ritual,

possibly mortuary, activity. The non-associated, fragmentary nature of most remains is inconsistent with other mortuary practices on the island, such as burial caves. Our dating of human bones in Te Rua Rere burial cave (Tava`enga District) indicates that some primary interments in this cave are coeval with the human remains at MAN-84. Thus if the human bones at MAN-84 represent some form of mortuary ritual, it was not the only mortuary practice on Mangaia at that time. Although much of the human bone is heated, very little of it is calcined, indicating that MAN-84 was not a simple crematory site (Correia 1997; Antón and Steadman, 1998). What seems clear is that human body parts, as well as some small fish, rats, and a few birds, were heated (?cooked) in traditional earth ovens at MAN-84.

While the large number of human bones in midden context at MAN-84 suggests a ritual or special-use of the site, the uniqueness of MAN-84 (on Mangaia or anywhere else in Oceania) precludes a clear understanding of its significance. Because MAN-84 is the only major site excavated thus far from Keia, it is difficult to assess its island-wide significance. Furthermore, interpretation is complicated by the fact that Keia is a district noted ethnohistorically for its island-wide ritualistic importance, including human sacrifice.

Conclusions:

The burial cave remains described here differ from those found in rockshelters and *marae*, and most especially from the former. Unlike human bones from rockshelters, the burial cave remains show no signs of intentional breakage, cleaning, or burning. The relatively complete nature of the burial cave remains, even after centuries of exposure to water and rodent activity, suggests that the mortuary rituals they represent are unrelated to the presence of highly fragmentary and burned human remains described from rockshelter middens (Steadman et al.,

2000). A full comparison cannot be made between the burial cave remains and those from MAN-100, although available data suggest that the burial cave remains are substantially more complete than those from near the *marae*. This difference, however, may reflect only the more protected nature of the burial cave.

Despite at least partial contemporaneity, the mortuary practices illustrated by the burial cave remains described here bear no resemblance to those from rockshelter sites. Preliminary evidence suggests a greater similarity between the human remains associated with *marae* and those from burial caves. Either Mangaian mortuary rituals were quite varied or, as we have suggested (Steadman et al., 2000), the human remains from rockshelter sites are not in a mortuary context.

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